IN THE CLAIMS:

1. (CURRENTLY AMENDED) A method of optimizing a coefficient of performance of a refrigeration system comprising the steps of:

compressing a refrigerant to a high pressure in a compressor device;

cooling said refrigerant ~~by exchanging heat between said refrigerant and a first fluid medium~~ in a heat rejecting heat exchanger;

expanding said refrigerant to a low pressure in an expansion device;

evaporating said refrigerant ~~by exchanging heat between said refrigerant and a second fluid~~ in a heat accepting heat exchanger;

sensing a parameter of said refrigeration system;

comparing said parameter to an efficiency parameter representative of an efficient refrigeration system;

determining a state of efficiency of the refrigeration system based on the step of comparing; and

adjusting said refrigeration system if the step of determining said state of efficiency determines that the refrigeration system is operating at an inefficient state to optimize the ~~coefficient of performance.~~

2. (ORIGINAL) The method as recited in claim 1 wherein said refrigerant is carbon dioxide.

3. (ORIGINAL) The method as recited in claim 1 wherein said parameter is an outlet temperature of said refrigerant exiting said heat rejecting heat exchanger.

4. (ORIGINAL) The method as recited in claim 1 wherein said parameter is an outlet enthalpy of said refrigerant exiting said heat rejecting heat exchanger.

5. (PREVIOUSLY PRESENTED) The method as recited in claim 1 wherein said parameter is a pressure difference between a first pressure of said refrigerant entering said heat rejecting heat exchanger and a second pressure of said refrigerant exiting said heat rejecting heat exchanger.

6. (CURRENTLY AMENDED) The method as recited in claim 1 wherein said parameter is a flow rate of ~~said first~~a fluid that exchanges heat with said refrigerant in said heat rejecting heat exchanger.

7. (CURRENTLY AMENDED) A method of optimizing a coefficient of performance of a refrigeration system comprising the steps of:

compressing a refrigerant to a high pressure in a compressor device;

cooling said refrigerant in a heat rejecting heat exchanger;

expanding said refrigerant to a low pressure in an expansion device;

evaporating said refrigerant in a heat accepting heat exchanger;

sensing a parameter of said refrigeration system, ~~The method as recited in claim 1~~ wherein said parameter is a temperature difference between a refrigerant temperature of said refrigerant exiting said heat rejecting heat exchanger and a fluid temperature of ~~said~~ a fluid entering said heat rejecting heat exchanger that exchanges heat with said refrigerant in said heat rejecting heat exchanger;

comparing said parameter to an efficiency parameter representative of an efficient refrigeration system;

determining a state of efficiency of the refrigeration system; and

adjusting said refrigeration system if the step of determining said state of efficiency determines that the refrigeration system is operating at an inefficient state.

8. (ORIGINAL) The method as recited in claim 1 wherein said parameter is a suction pressure of said refrigerant entering said compressor device.

9. (ORIGINAL) The method as recited in claim 1 wherein said parameter is a temperature of said refrigerant exiting said compressor device.

10. (PREVIOUSLY PRESENTED) The method as recited in claim 1 wherein said parameter is a size of an opening of said expansion device.

11. (ORIGINAL) The method as recited in claim 1 wherein said parameter is a quality of said refrigerant entering said heat accepting heat exchanger.

12. (ORIGINAL) The method as recited in claim 1 wherein said paramcter is a coefficient of performance of the refrigeration system

13. (ORIGINAL) The method as recited in claim 1 wherein said parameter is a refrigerant mass flow rate of the refrigeration system.

14. (CURRENTLY AMENDED) The method as recited in claim 1 wherein the step of adjusting said refrigeration system includes increasing a flow rate of ~~said a~~ fluid ~~medium flowing~~ through said heat rejecting heat exchanger that exchanges heat with said refrigerant.

15. (PREVIOUSLY PRESENTED) The method as recited in claim 1 wherein the step of adjusting said refrigeration system includes increasing a size of an opening of said expansion device.

16. (CURRENTLY AMENDED) A transcritical refrigeration system comprising:

a compression device to compress a refrigerant to a high pressure;

a heat rejecting heat exchanger for cooling said refrigerant~~, and a first fluid flows through said heat rejecting heat exchanger to exchange heat with said refrigerant~~;

an expansion device for reducing said refrigerant to a low pressure;

a heat accepting heat exchanger for evaporating said refrigerant~~, and a second fluid exchanges heat with said refrigerant in said heat accepting heat exchanger~~;

a sensor to sense a parameter of the refrigerant system; and

a control that stores an efficiency value of said parameter representative of an efficient state of the refrigeration system, compares said efficiency value to said parameter to determine a state of efficiency the refrigeration system, and adjusts the refrigeration system if the refrigeration system is determined to be operating in an inefficient state to optimize a coefficient of performance of the system.

17. (NEW) The system as recited in claim 16 wherein said parameter is a temperature difference between a refrigerant temperature of said refrigerant exiting said heat rejecting heat exchanger and a fluid temperature of a fluid entering said heat rejecting heat exchanger that exchanges heat with said refrigerant in said heat rejecting heat exchanger.

18. (NEW) The method as recited in claim 1 wherein a fluid exchanges heat with said refrigerant in said heat rejecting heat exchanger, and said fluid is water.

19. (NEW) The system as recited in claim 16 wherein a fluid exchanges heat with said refrigerant in said heat rejecting heat exchanger, and said fluid is water.